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ABSTRACT

The influence of childbearing on a family's ability to accumulate assets is examined in this paper. The first section presents a theoretical framework for analyzing the evolving life-time process of asset accumulation. This model highlights the principal factors that determine life cycle paths of consumption, income, savings, and the time allocation of spouses. Within this framework, some potential avenues are examined through which childbearing patterns of families may impinge on these decisions and hence alter a family's desired asset accumulation. The second section discusses the data source employed in this research and provides operational definitions of the empirical variables. The third section summarizes the major empirical findings. In addition to estimating the impact of children on asset growth, estimates are provided of the influence of family size on the composition of the asset portifolio. The major channels through which family size alters savings behavior are also explored. The channels investigated include family consumption, wife's income, and hours worked of each spouse. (Author/JMB)

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ASSET ACCUMULATION AND FAMILY SIZE

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PREFACE

The research presented in this Note was funded by the National Institute of Child Health and Human Development under Contract No. NO1-HD-52837-NIH. This contract funded research into the impact of the spacing, timing, and number of children in a family on several aspects of family behavior. Two Rand Reports have already been published under this contract. They are:

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SUMMARY

In this Note, we investigate the impact of patterns of child-bearing on a family's net worth. The number of children a couple has, the average spacing between siblings and the timing of births within a marriage have all been alleged to have important effects on family savings. In this study, we test these hypotheses using a three-year micro data file for the period 1967-1970. In addition to estimating the impact of children on asset growth, we provide estimates of their influence on the composition of the asset portfolio and explore the major channels through which family size alters savings behavior. The channels investigated include family consumption, wife's income, and hours worked of each spouse.

We estimate that the net effect of young children is to depress savings for young families, but to increase savings for marriages of duration greater than five years. The principal channel, through which children act to reduce savings, is the decline in female earnings associated with the child-induced withdrawal of wives from the labor market. Family consumption actually decreases with the birth of a child but this reduction is insufficient to offset the fall in family income.

We also find that the impact of children on the family's financial position is critically dependent on the duration of marriage. Children born early in a marriage reduce assets by approximately twelve percent while those born after nine years of marriage increase assets by two percent. This difference is due to two effects: early child bearing has a somewhat smaller negative effect on consumption and also induces a larger negative effect on female earnings. Our results on asset composition indicate that early births are associated with a switch from financial to durable goods assets, while for the latter births this effect is greatly reduced. As the child ages and enters school, his effect on family savings is greatly reduced. On average, wives with school-age children have $163 lower earnings, but their families consume $106 less. The net effect on savings is insignificant.

These results contrast sharply with earlier research which has found significant positive effects of children on family consumption. We duplicate these results and show that they are due to a misspecification of the family income constraint in which current family income rather than the permanent level is held constant. By allowing in our specification for families to freely allocate their time between the market and home, we have found that children induce a substitution toward "leisure" and away from market goods.

For the more traditional economic determinants of savings and consumption, our results are consistent with earlier findings. We do offer new evidence that a family's response to changes in husband's income varies systematically with marriage duration. Among young married couples, more of the response to a decline in husband's income is absorbed by family consumption. In addition, the wife compensates in part for this income decline by increasing her market work and income. In contrast, among couples married for longer periods, short-run changes in husband's income are reflected primarily in family savings.

ASSET ACCUMULATION AND FAMILY SIZE

In this paper, we examine the influence of child bearing on a family's ability to accumulate assets. The number of children a couple has, the average spacing between siblings and the timing of births within a marriage have all been alleged to have important impacts on family savings. For example, the relationship between family size and household savings has long been a popular theme in the demographic and development literature, and the postulated negative correlation between them is thought to be a contributing factor in limiting capital formation and economic growth. More recent investigations of American data have indicated that rapid child bearing early in marriage inhibits asset growth and that these effects persist over a couple's life time (Freedman and Coombs, 1966, 1970). Others have argued that family size per se is not the relevant constraint, and that any savings effects are related primarily to the age of children (Espenshade, 1975). In a complementary literature, researchers have attempted to measure the direct costs of children in terms of the additional consumption expenditures induced by the presence of a child (Espenshade, 1973). In this study, we test a number of these hypotheses using a 3-year micro-longitudinal data file for the period 1967-1970. This data is unique in the breadth and quality of its information on the components of a family's assets and liabilities. Research on this issue has been frustrated in part because the available savings and asset data was recognized to be limited in scope and poorly measured.

In the first section of this paper, we present a theoretical framework for analyzing the evolving life-time process of asset accumulation. This model highlights the principal factors that determine life cycle paths of consumption, income, savings, and the time allocation of spouses. Within this framework, we examine some potential avenues through which child-bearing patterns of families may impinge on these decisions and hence alter a family's desired asset accumulation. Section 2 discusses the data source employed in this research and provides operational definitions of the empirical variables. The third section summarizes our major empirical findings. In addition to estimating the impact of children on asset growth, we provide estimates of their influence on the composition of the asset portfolio and explore the major channels through which family

size alters savings behavior. The channels investigated include family consumption, wife's income, and hours worked of each spouse.

Section 1: A Theoretical Framework

To understand the relationship between assets and children, a multi-period theory of asset accumulation and savings is required. In this section, we sketch such a framework with an eye toward highlighting the major factors that determine the life-cycle paths of consumption, income, savings, and time allocation of spouses. Since a formal development of this life-cycle model is outside the scope of this paper, we present instead a heuristic treatment[1] To set ideas, we begin with the simplest of such models and then move to complications that arise when we relax assumptions.

When viewed in a life-cycle perspective, savings and asset accumulation depend entirely on the life-time profiles of consumption and income.[2] In the simplest of such models families begin their lives with an initial stock of assets, some desired level of bequests, a known stream of income over their lifetimes, and access to a capital market in which borrowing and savings can serve to transfer funds over time. Since future incomes are known in advance, the only decision to be made by the family is one of allocating their wealth (initial assets plus the discounted flow of future income) over their lifetime regardless of the timing of their income receipts. The only difference between such families is that those whose income paths do not coincide with their desired consumption paths would borrow or save so as to attain their desired consumption rates. In explaining savings rates, therefore, the emphasis in these models is on the *timing* of income receipts.

The emphasis on income flows, rather than consumption flows, stems from the presumption that families' tastes are such that smooth lifetime consumption paths are preferable to those with peaks and troughs.

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[1] For a more formal treatment of most of the elements of this model, see Smith (1977).

[2] Savings is defined in the conventional manner as the difference between current income and current consumption while assets at any age are accumulated savings.

Once the smoothness hypothesis is accepted, it follows that income movements over a family's lifetime will not affect consumption levels but will be absorbed by saving and borrowing during periods of super- or subnormal income.

Even within this simple framework a series of important implications can be derived. First, access to perfect capital markets implies that lifetime wealth, rather than current income, is the determinant of consumption. If we translate this wealth measure into a flow concept, permanent income, then it follows that current income levels which exceed permanent income will tend to be saved while those which fall short will usually lead to dissaving. The caveats apply to these implications because families will typically not prefer constant consumption levels over their lifetime nor will they always wish to leave bequests.

Constant consumption profiles will result only if families' intertemporal time preference[1] exactly matches the market interest rate. In this case their willingness to transfer consumption across time exactly matches the market price for doing so with the net result that no incentive exists to consume more in one period than another. If couples' "rate of time preference" (for current consumption) is less than the interest rate, then they will consume less early in life than later, and consumption paths will grow over time, with the implication that saving is more likely early in life. Exactly the opposite would occur if the rate of preference exceeded the interest rate.[2]

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[1] Time preference is defined as individual *subjective* value of a unit of present consumption in terms of future consumption evaluated at equal levels of present and future consumption.

[2] These statements are not really implications of a model as much as they are statements that couples' own preferences will affect the timing of their consumption. What is an implication is that the rate of interest at which couples can borrow and save will affect the timing of their consumption and hence their savings rates: higher interest rates induce greater future consumption and, therefore, greater savings early in the life cycle.

The second caveat refers to couples' desire to leave assets to their heirs and introduces the first channel through which children may affect family savings. Obviously, the greater is this bequest motive for saving, the less consumable wealth is available to parents and, for a given lifetime income stream, the greater will be savings. Conversely, families that leave zero bequests can consume at levels which are higher than those permanently maintainable.

Though bequests are normally thought of as end-of-life transfers to children, in a perfect-foresight/perfect-capital markets model there is no reason to expect *parents'* consumption behavior to depend on the timing of the transfer. Since parents can borrow on future income, the transfer can be made at any point in the parent's life cycle. As such, the bequest should be thought of as an increase in the resources directed to the child. The only problem with such a definition of bequests is that the child's consumption is included in family consumption only during the childrearing period. Hence, a bequest to the child taking the form of a college education would be measured as family consumption, whereas a cash grant at the time of death would not. In the first case, savings would be lower while the transfer is being made and would be higher both before and after the transfer. If the bequest were made at the end of the parents' life, savings would be higher over the entire life cycle. The aggregate amount of life-cycle savings by parents (the discounted difference between parents' income and *parents'* consumption) will be higher if a bequest motive is present. To the extent, though, that parents wish to transfer resources to children *after* they leave the parents' household, bequests will raise savings rates at all points in the parents' life cycle and increasing family size would increase savings.

Other than the effects of interest rates and bequests, this simple life cycle model of saving stresses the role of savings as a consumption smoothing device and hence attributes the bulk of savings behavior to changes in current income. Recent work in the theory of life-cycle labor supply has brought more balance to theories of saving by placing emphasis on the determinants of life-cycle consumption, in addition to income. In these models the family is seen, not only as a pure consumer

of market goods, but also as a consumer of its own leisure time. Hence, while maintaining the "smoothness" hypothesis of the traditional theory, a more general formulation is offered, one in which families may substitute over their lifetime between market goods and leisure time while maintaining an even flow of the mix.

For example, families in which the husband has a rising real wage over the life cycle will have an incentive to consume his leisure when it is cheapest, at young ages, and to reduce leisure consumption as he ages. Other than the obvious implications that his hours of work and income will rise over time, rising husband's wage may lead to substitution away from his leisure and toward the other items in the family's basket of commodities with the implication that consumption of goods will rise while the leisure time of the wife will fall. If the time of husbands and wives are substitutes, increasing male wages will also reduce labor supply of the wife. But any rise in consumption must be less than the increase in earnings, so that rising income will increase savings. A symmetric set of arguments apply for a rising wage profile of the wife.

With its emphasis on life cycle time allocation, this model places particular stress on the relationship between the time allocation (market versus household) of household members and their consumption of market goods. This relationship introduces another channel through which children may alter savings. A rise in the value of household time, induced by the presence of a child, will lead to a reallocation of household resources, not only when the child is present in the household, but throughout the lifetime of the parents. Since children will typically raise the value of their mother's time in the household much more than that of their father, families will reallocate the mother's time away from market work. Such an effect is equivalent to a fall in the wife's wage.[1] Continuing with this analogy, the family will be induced, by a decline in the value of the wife's market

[1]That is, the reallocation of the wife's time away from the market and toward the home is induced by the same kind of substitution effect.

time, to allocate more of the husband's time to the market sector: in other words, husbands should work more. Whether the family will purchase more or fewer market goods, i.e., consume more or less, depends on whether these goods are complements with or substitutes for the time of household members.

To give just two examples, living space and household durable goods are probably complementary with household time, while restaurant meals, vacations, and other forms of market entertainment are probably substitutes. While we are not prepared to argue these divisions with any conviction, the critical point is that there is no presumption from the theory that the presence of a child and the consequent increase in the value of a wife's time will lead to an increase in the consumption level of the household.

It has been widely and traditionally assumed that children raise the consumption level of a household. The argument, presumably, is that since children eat and themselves consume, they must of necessity cause the household to consume more. This would follow only if the reallocation of husbands' and wives' time fails to reduce their own consumption. If items in the household consumption bundle are dominated by substitutes for household time, then total family consumption may fall when children are present.

Whether family consumption, including that of children, rises or falls will depend also on the current composition of the family's consumption bundle. For example, if the family already owns a house and other goods which are complementary with household time and children, then the birth of a child would affect total consumption mainly through its impact on goods which are substitutes for household time and children, hence, raising the likelihood that total consumption would fall. Conversely, new families who have not yet purchased these child-complementary goods will be induced to do so when their children are first born.

In this case the net effect of a child on total consumption would depend on whether complementary goods rise more than substitute goods fall. In either case though we would expect that the effect of children

on total consumption would itself be a function of the age and previous consumption history of the family, and the age of a child. If so, then the effect of children on savings will depend on whether the withdrawal of the wife from the labor force lowers current family income more than family consumption.

A second consideration concerns the effect of children on the wages and income of family members. Since a withdrawal from the labor force interrupts the continuity of experience accumulation, the effects will be felt not only during the period of withdrawal but also in subsequent periods. Career interruption will lead to lower future earnings because market skills depreciate outside of the labor force. Moreover, a child born in mid-career, if planned in advance, would lead women to invest less in market skills. Children born early in a marriage should then lead to greater continuity of future earnings growth than would children born late in marriage.

These arguments suggest that children born early in the marriage are less costly in terms of lifetime income, and lead to higher future income growth, than children born later in marriage. These effects, however, have opposite implications for savings. A steeper wage and income profile for the family would lead to less savings early in the marriage, while the interruption of this path early on would lead to a smaller decline in income and hence smaller reduction in savings.

The same reasoning also has implications for the effects of spacing of births. If the birth of a child induces complete withdrawal from the labor force for more than one year, then the loss of income and labor supply over the life cycle will be less if all births are bunched together. If the bunching of births leads to less lifetime income reduction, but a greater *concentration* of income reduction, then savings rates will be lower for families with closely spaced births.

In the discussion to this point, we have proceeded as if the family had perfect foresight and was able, therefore, to decipher whether changes in its income were abnormal events or whether they were part of a longer-run lifetime growth or contraction of their economic circumstance.

The assumption of perfect foresight, while analytically convenient, should be considered as one polar extreme. At the other extreme, myopic families might be led to consider year-to-year changes in income as permanent movement. While the truth clearly lies somewhere in between, it is worthwhile to consider the qualitative impact of uncertainty on families' savings behavior. In so doing, we do not attempt to give these issues an analytic treatment but simply point out the ways in which the conventional results should be modified.

In a world in which the future is uncertain, the assumption that families can borrow and save at the same interest rate is made untenable. If families are themselves unsure of their lifetime incomes, then attempts on their part to borrow against this future stream carries with it the potential for default. It would follow then that the reaction of lending institutions to this uncertainty would be to charge a premium on loans whose repayment is not certain. Other responses by these institutions would include collateral requirements, down payments and other contractual arrangements designed to secure repayment. The net effect of all this is to raise the cost of borrowing above what would exist in a riskless world and to make borrowing rates of interest exceed those of savings. This phenomenon is referred to as an "imperfect" capital market.

To see the effect of imperfect capital markets on savings behavior, consider the extreme case of prohibition of borrowing. If families begin their lives with low levels of initial assets, then the inability to borrow will lead to greater precautionary asset accumulation since shocks to their income stream can now only be absorbed with previously accumulated savings. In addition, if income falls the family is more likely to find itself pressed against credit constraints and to be forced to reduce its current consumption. It would follow then that consumption would move more closely with current income, in such a world, when compared to the situation in which borrowing is allowed.

For families with two or more potential working members, this result can be taken a further step. If the husband's income were to fall, and if borrowing were prohibited, then the reduction in consumption could take the form of reduced leisure consumption by other family

members, viz., the wife would tend to enter the labor force or, if already working, could work longer hours. In effect, the market labor supply of wives can serve the function of a lending institution, smoothing the movements in her spouse's income.

As the family ages, and accumulates its own savings reserve, credit constraints are less binding since couples can implicitly borrow from themselves. Hence, changes in current income should affect current consumption and spouse's labor supply less as the family ages. In principle, at least, older families should act much like those we discussed earlier, who can borrow and save at the same interest rate.

In addition to this rather roundabout effect of uncertainty, there are more direct influences which serve to modify the traditional life-cycle savings theory. In the perfect certainty case there are no surprises, so that fluctuations in income do not cause families to revise either their expectations of future plans. Because of this, lifetime wealth will not be influenced by short-run events. If future income is uncertain, however, then year-to-year changes are not completely innocuous from a lifetime perspective, for they provide signals to families about more distant income prospects and hence influence perceptions of lifetime wealth. Especially for young families who have accumulated very little information about their long-run earnings, the income experience early in the life cycle weighs heavily in their future projections. The effect of this is to cloud the distinction between movements in transitory income movements and movements in lifetime wealth. Unlike the perfect certainty case, transitory changes in income will affect consumption since they alter couples' predictions of wealth. As the family ages, though, transitory income changes should have less of an effect on consumption since more information will have accrued pertaining to the families' long-run wealth, so that departures from normal income will be interpreted as just that, anomalies rather than portents of fundamental change.

We conclude this section by summarizing the implications of the life-cycle saving model for the empirical analysis which follows. First, the model stresses that current saving behavior is dependent not only on the current income situation of the family but also on the expected future flow of income.

Issues related to uncertainty, imperfect capital markets, and life-cycle allocation of time further suggest that the changes in current income and growth rates of income will affect families differently depending on their life-cycle stage. Second, the distinction between male and female components of family earnings is emphasized since young children will affect the allocation of spouses' time between market and non-market uses and, therefore, will potentially affect not only total family income but also the level and composition of their consumption. Since this view stresses that family income is itself affected by children, any investigation into the net impact of children on savings should allow this channel of influence to operate independently.[1] Third, the effect of children on savings and consumption should depend on the timing of births within the marriage. The impact of female career interruption and the effect of children on the composition of the consumption bundle suggest that births early in the life cycle can affect consumption differently than later births, even if these births are of the same parity order.

In the following sections we describe operational definitions of the conceptual variables discussed above. We go on to specify an empirical model designed to measure the impact of these variables on savings rates, and we show the channels through which children affect savings: by altering husbands' and wives' incomes, aggregate consumption, and the allocation of financial assets.

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[1] We return to this issue below in the discussion of our regression results.

Section 2: Data and Variables

Our empirical research is based on the Panel Study of Consumer Durables and Installment Debt collected by the Survey Research Center of the University of Michigan. This data set is a three-year panel survey of 1434 families for the years 1968 through 1970.[1] In each year, individuals were questioned about their previous year's income, by source, their labor force status, family size and composition, and detailed components of the current value of their assets and liabilities. To our knowledge, no other national micro-longitudinal data file combines the richness and detail of information on assets and liabilities available in this survey with other important data on the income and labor force dynamics of the family.[2] Because the primary purpose of this panel study was to examine financial adjustments of individuals over time, more attention and quality control was directed at the asset and debt variables.

Of the original 1434 families, it was necessary to exclude a number of families from the analysis. Table 2.1 documents, by reason, the number excluded. Since we are attempting to trace the effect of family composition on asset growth for intact families, a total of 286 families who were not intact for the complete duration of the panel

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[1] In 1967, a national cross-section of 2604 family units whose heads were under age 60 were interviewed. By the end of the fourth wave of the panel, 1434 families remained. For an analysis of response rates and biases in the panel see "Consumer Durables and Installment Debt" by Gary Hendricks, Kenwood Youmans, and Janet Keller, Survey Research Center, University of Michigan, 1973, Appendix D. Families more likely to remain in the panel were married, high-income, larger-sized and homeowning. The original tape followed families for four years--1967 through 1970. We did not use the initial year (1967) because the data on financial assets were coded in very large intervals in that year. Starting in 1968, dollar values for the financial assets variables were given. However, the 1967 data were employed to construct certain variables used in the empirical work.

[2] The other major panel sets used to study income and labor force behavior contain at best limited data on only components of a family's net worth position. See, for example, "The Michigan Income Dynamics Panel" and the "Parnes" data.

Table 2.1

SUMMARY OF REASONS FOR DROPPING OBSERVATIONS

Reason Excluded	Number Excluded	Remaining Number of Families Per Year
Original Sample	--	1434
Not Married Spouse Present	234	1200
Spouse Change During Survey	52	1148
Inconsistencies in Ages of Children	50	1098
Farm Families	14	1084
Unreliable Financial Assets	74	1010
Unreliable Housing Net Worth	39	971
Unreliable Data in other Net Worth Data	5	966
Married More than 18 Years in 1970	472	494

were deleted. Families were also excluded if they gave unreliable responses on components of the asset or debt variables. This consisted most frequently of missing data (e.g., a homeowner who does not report the market value of his house) or gross discrepancies in asset levels across years. In addition, fifty families were excluded because of inconsistencies in the ages or number of children across the survey years. Finally, the Michigan survey questioned families only on the age and number of their children who were less than 18 years old. Because of this limitation, we restricted our empirical work to families married less than 19 years in 1970.[1]

The variables which we consider in this study can be divided into five categories: income, labor force activity, household demographic characteristics, net worth, and children. Selected means in the first three categories are listed in Table 2.2. Modern economic theories of

[1]The statistical issues caused by our sample restriction are discussed in Appendix A.

Table 2.2

SAMPLE MEANS

(Married Less Than 19 Years in 1970)

Income Variables	1968	1969	1970
Average Husband's Income	--	9098	--
Yearly Change in Husband's Income	--	634	830
Husband's Income	8399	9033	9863
Wife's Income	1338	1464	1675
Family's Monthly Income Highly Variable	.10*	--	--
Labor Force Variables			
Wife Worked Last Year	.54	.53	.57
Husband's Weeks Worked	46.1	46.1	46.8
Husband's Weekly Hours Worked	44.4	45.0	45.2
Husband's Weeks Unemployed	.83	.91	1.1
Husband's Annual Hours Worked	2255	2249	2204
Husband's Tenure on Present Job**	7.73	8.10	--
Husband Had Second Job	.22	.19	.20
Husband is a Union Member	.30	--	--
Fraction of Time Since Marriage that Wife Worked	--	--	.35
Wife's Annual Hours Worked	645	615	594
Household Demographic Variables			
Duration of Marriage	--	--	10.7
Age of Husband	--	--	35.8
Age of Wife	--	--	33.3
Husband's Education	--	--	12.5
Wife's Education	--	--	12.1
Proportion White	--	--	.88

*question asked in 1967 only.

**question not asked in 1970.

consumption suggest two distinct income concepts relevant for savings behavior--permanent or lifetime income of households and transitory deviations of current income from its permanent level.[1] To approximate this distinction,[2] we opted for simplicity and used a four-year average of husband's income to measure the long-run income concept and yearly changes in husband's income to index more transitory variation.[3] These distinctions are not exact and we discuss their interpretation below in the context of the regression results.

Wives' income was not included in these constructs because one of the principal mechanisms through which children affect family savings and assets is through the wife's labor supply and earnings. To the extent that the wife's earnings are a mechanism through which the family accumulates savings, it is inappropriate to control for this channel of influence. What is appropriate is to explain how the wife's earnings are affected by those other variables which influence family savings, an issue we address later. Families were also asked if their income varied a great deal from month to month. In a world of imperfect capital markets, monthly income instability could induce an insurance motive for savings. While the response to this question is qualitative, it does capture income movements which could be hidden in annual data. Ten percent of the families reported having variable monthly income.

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[1] For two famous economic studies that rely heavily on this distinction between permanent and transitory income, see Friedman (1957) and Brumberg and Modigliani (1962).

[2] In the consumption function literature, more elaborate and complex methods of defining permanent and transitory income have been proposed. We decided in favor of the simpler definitions used here because this distinction is not the main focus of our research. In addition, many of the more complicated definitions were developed for time series data and are not directly applicable to our data.

[3] As we discuss in Section 3, yearly changes in husband's income also capture in part future career wage growth trajectories.

The labor supply definition used in this research is yearly annual hours of work--the product of weeks worked and usual weekly hours.[1] In every year of the survey, each spouse answered a number of questions on their labor market activity--weeks worked and weeks of unemployment in the previous year, usual weekly hours worked, and major occupation of employment. Husbands were also queried on their union membership, tenure on their current jobs, whether they had a second job, and annual hours worked on the second job. Thirty percent of the men were union members and one-fifth had at least two jobs. Wives were questioned about the extent of their market participation since marriage. More than half the women worked in any given year and the average woman worked approximately 1/3 of the years since her marriage.

Our household demographic variables are the conventional ones: age and education[2] of spouses, duration of current marriage,[3] and race. Closely reflecting the national rates, 88 percent of the families in our sample were white. Wives were about two years younger than their husbands and had 1/2 year less schooling.

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[1] For husbands, annual working hours includes the hours worked on second jobs.

[2] Responses to education level in the survey were in brackets. We used the following recodes to obtain a cardinal measure:

Original Code	Recode
0-5	2.5
6-8	7
9-11	10
12	12
13-15	14
16	16
17+	18

[3] No information was available on the existence or length of previous marriages. In the regressions reported in Section 3, we offer a partial control for this problem.

Family net worth is derived from five categories: (1) net equity in the home[1]; (2) net equity on cars[2]; (3) total installment and non-installment debts[3]; (4) the value of consumer durables[4]; (5) the value of financial assets held in checking, savings and certificates of deposit, stocks and bonds minus the amount owed on stocks. Total net worth is defined as the sum of categories 1, 2, 4, and 5 minus category 3. Net worth, in the form of durable assets, is the sum of 1, 2, and 4 minus 3; and financial net worth is category 5. Table 2.3 lists the components of total net worth, total financial net worth, total durables net worth for the years of the panel.

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[1]Individuals were asked in each year the current market value of their home and the amount of first and second mortgages on their home. Net equity is equal to current market value minus all outstanding debts on home.

[2]Net equity on cars was derived as follows. For each car, interviewees were asked the make, year and body style of all cars owned. Based on these characteristics, the National Automobile Dealers Association (NADA) book value was used to impute a value to the car. From the total value of all cars, we subtracted total installment and non-installment debts on cars.

[3]Installment and non-installment debt for the following categories were included: additions and repairs, medical and dental, debts on durable goods purchases and "other" installment and non-installment debts. The other category included other consumer installment debts (e.g., dishwasher, hi-fi, radio, furniture, lawnmowers, sporting goods, and consolidation loans).

[4]Six types of durable goods were included: black and white television, color television, refrigerator, washing machine, stove and air conditioner. In the initial survey year, in each category, ownership and age of each durable were recorded. The average retail values of these six appliances were gathered from various editions of *Merchandising Week*, 1967-1979. The average retail values used were: black and white TV - $175; color TV - $550; refrigerator - $280; washing machine - $230; stove - $200; air conditioner - $200. Eight-year useful lives were used for TVs and air conditioners; seven-year life for washing machines; twelve-year life for refrigerators; and 20-year life for a stove. At the end of the useful life, scrap values were $25 black and white TV; $100 color TV; $40 air conditioner, and $50 for the others. Straight line depreciation was used between purchase value and scrap value. These assumptions generated initial dollar values for the stock of these durables in 1966. In each year, the cost of new durable purchases were added to 90 percent of the value of the previous year's stock.

Table 2.3

COMPONENTS OF NET WORTH

A. Full Sample

	1968	1969	1970
Total Net Worth	13,788	15,731	17,940
Total Financial Net Worth	3,796	4,507	5,106
Total Durable Net Worth	9,993	11,223	12,834
Housing Value	14,078	15,553	17,040
Mortgage	5,316	5,637	5,774
Net Car Value	996	978	1,117
Installment/Noninstallment Debt	711	793	820
Durable Goods	946	1,122	1,271
Checking	391	462	529
Savings	1,895	2,086	2,559
Net Stock Value	1,219	1,622	1,661
Bonds	291	337	357

B. Married Less than 19 Years in 1970

	1968	1969	1970
Total Net Worth	8,841	10,366	12,252
Total Financial Net Worth	2,305	2,611	3,071
Total Durable Net Worth	6,535	7,754	9,181
Housing Value	11,731	13,415	14,964
Mortgage	6,032	6,619	7.081
Net Car Value	818	764	922
Installment/Noninstallment Debt	861	890	943
Durable Goods	971	1,169	1,319
Checking	269	297	325
Savings	1,093	1,122	1,436
Net Stock Value	739	958	1,048
Bonds	203	233	261

In nominal terms, net worth grew by 13.2 percent per year between 1968 and 1970. This growth was somewhat larger--16.3 percent--for families married less than 19 years in 1970 reflecting their position in an earlier phase of the life cycle where more rapid asset accumulation normally occurs. In each year, approximately 70 percent of net worth consists of durables with housing equity dominating the durable component.[1]

Ideally, we would like to know the exact ages of all ever-born children in the household. Unfortunately, the survey instruments dictated a set of family composition variables that fall short of that mark. The major limitation we confronted was that families were asked in each year only the number of children in the household who were less than 18 years old. Respondents were also questioned about the number and age of all *unmarried* children under 25 years old not living at home. With this exception, no information exists on any children over 18 years old in 1967.[2] We were also faced with incomplete data on the ages of children

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[1] Another important characteristic of the asset portfolio is that many families have zero assets in certain categories. For example, as indicated in the table below, less than one-third of the families have any stocks or bonds and one-fifth of the families married less than 19 years do not own a home:

PROPORTION OF SAMPLE WITH ZERO ASSETS (1970)

	A. Full Sample	B. Married Less Than 19 Years
Housing Value	.18	.24
Car Value	.06	.06
Installment/Non-Installment Debt	.37	.27
Durable Goods	.00	.00
Checking	.21	.22
Savings	.29	.29
Net Stock Value	.73	.72
Bonds	.72	.69

[2] Obviously, we can identify all children less than 21 years old in 1970.

in the household. In each year, the family was asked the age of their youngest child, the age of their oldest child (under 18), as well as the ages of all children between 15 and 17 years old. However, with a little detective work, our panel enabled us to obtain the precise ages of other children. Because these questions were asked in all four years, we were able to determine the ages of all children 12-17 years old in 1967. For many families, we also discovered the ages of additional children when either the youngest child (i.e., due to a new birth) or oldest child (i.e., when the original oldest child became older than 17) changed during the panel. Thus, for family sizes of two or less, we know the ages of all children. Regardless of family size, we also know the ages of all children 12-17 years old in 1967. In addition, for many families with more than two children, the ages of other children were deduced by changes in the identity of the youngest or oldest child. In those families in which we could not determine the age of all children, we assumed that the unknown children were born in a year evenly spaced between the ages of the known children.[1] Table 2.4 lists the number of families with different parities and also indicates the proportion of families and children for whom age imputations were necessary. Ages were imputed for only 15 percent of the children. Moreover, for many of these children, the error in imputing ages is likely to be small because the number of years between the ages of the youngest and oldest child is itself small.

There was little we could do directly about the absence of information on all children ever born who were older than 18 years in 1967. For families in later stages of the life cycle when adult children are common, the measures of family size and child spacing available in this data are clearly inadequate. These older children undoubtedly affect past and current assets, and analysis over the full sample of families would produce biased and uninterpretable results. Since there is no way of retrieving directly the absent information on older children, we restricted our regressions to those families who were married less than 19 years in 1970. For these families, we are reasonably certain that their

[1]This is subject to the constraint that the child could not have been between 12 and 17 years old in 1967.

Table 2.4

PERCENTAGE OF HOUSEHOLDS BY NUMBER OF CHILDREN:
FAMILIES MARRIED LESS THAN 19 YEARS IN 1970

	Year		
Number of Children	1968	1969	1970
0	13.8	11.9	11.1
1	21.3	17.0	15.8
2	27.1	27.9	27.3
3	20.5	22.1	24.3
4 or more	17.4	21.3	21.5
Average number of children	2.18	2.39	2.46
Proportion of families in which the age of at least one child was imputed		.26	
Proportion of children with imputed age		.15	

history of child bearing is complete. Confining the analysis to this restricted sample does create statistical problems of sample censoring. In Appendix A, we discuss the nature of those biases and the statistical techniques we employed to control for them.

Section 3: Empirical Analysis

In this section, we summarize the main results from our empirical research. We first present some cross-tabulations relating measures of family size and composition to the net-worth position of households. While these simple two-way classifications can only be suggestive, they do guide our statistical exploration and suggest a number of hypotheses to be tested. We next report the principal empirical relationships estimated in this study. In addition to our primary regression relating family size to asset growth, estimates of the effects of children on the composition of assets, family consumption, wives' income and hours worked of both spouses are provided.

Tables 3.1 and 3.2 list the components of net worth by number and age distribution of children, respectively, for families at different marriage durations. Although such simple cross-tabulations must be interpreted cautiously, a number of patterns do seem apparent. Most importantly, net worth differences are largest in the early years of marriage (1-9 years). Families without children have substantially more net worth than couples who have commenced childbearing. However, among families with children, differences in number of children are associated with only small net worth differences. Turning to Table 3.2, families with the smallest net worth are those with children under five. While this partly reflects their early life cycle status, families with children both under and over five years of age have $1600 less net worth than those only with children over five. In the early years of marriage, young children apparently inhibit a family's ability to accumulate assets.

These differences in asset levels for short marriage durations are by and large eliminated among families with longer durations. Although net worth rises slightly with family size, the positive correlation of family size with husband's age within this interval may account for much of this difference. Table 3.2 also indicates a marked convergence in net worth positions as marriage duration increases. Apparently, the large initial differences in net worth by family size and presence of young children erode rapidly and may even reverse.

Table 3.1

COMPONENTS OF NET WORTH BY FAMILY SIZE

Married Less Than 10 Years

	Number of Children			
	0	1	2	3
Total Net Worth	10,954	6,084	7,120	7,803
Total Financial Worth	4,545	1,933	1,858	1,502
Total Durables	6,408	4,151	5,262	6,301
Housing Value	10,140	7,554	10,698	12,132
Mortgage	5,159	4,329	6,337	6,583
Car Value	1,020	745	847	620
Installment/Noninstallment Debt	833	912	1,044	1,082
Durable Goods	1,239	1,193	1,098	1,214
Checking	312	219	183	181
Savings	2,655	940	991	709
Net Stock Value	1,423	641	453	521
Bonds	156	133	230	92

Married 10-18 Years

	Number of Children				
	0	1	2	3	4 or more
Total Net Worth	10,281	12,141	13,985	15,369	12,678
Total Financial Worth	3,206	2,849	3,531	4,470	2,579
Total Durables	7,074	9,292	10,454	10,899	10,999
Housing Value	9,571	12,855	16,365	18,683	16,544
Mortgage	4,375	5,018	7,309	8,956	7,248
Car Value	1,064	525	975	935	737
Installment/Noninstallment Debt	263	670	706	945	1,033
Durable Goods	1,088	1,100	1,129	1,183	1,099
Checking	388	372	454	380	379
Savings	2,077	981	1,542	1,516	987
Net Stock Value	532	1,328	1,137	2,181	1,077
Bonds	209	167	397	392	134

Married 19-25 Years

	Number of Children				
	0	1	2	3	4 or more
Total Net Worth	19,119	21,993	24,275	20,294	14,960
Total Financial Worth	4,958	5,922	6,872	5,021	3,082
Total Durables	14,162	16,071	17,402	15,272	11,877
Housing Value	16,638	19,313	21,232	20,071	16,540
Mortgage	4,473	5,203	5,514	6,443	6,026
Car Value	1,311	1,294	1,236	1,385	1,050
Installment/Noninstallment Debt	351	531	753	824	841
Durable Goods	1,037	1,199	1,202	1,084	1,154
Checking	383	804	971	1,032	262
Savings	3,112	3,136	2,333	1,469	1,689
Net Stock Value	555	1,498	3,232	2,243	1,075
Bonds	907	489	337	278	56

Table 3.2

COMPONENTS OF NET WORTH BY FAMILY TYPE

Married Less Than 10 Years

	Family Type*			
	0	1	2	3
Total Net Worth	10,954	8,995	5,812	7,337
Total Financial Worth	4,546	2,415	1,629	1,858
Total Durables	6,408	6,580	4,183	5,479
Housing Value	10,140	12,711	7,638	10,838
Mortgage	5,159	7,267	4,381	6,184
Car Value	1,020	757	747	351
Installment/Noninstallment Debt	833	822	1,023	1,030
Durable Goods	1,239	1,201	1,201	1,104
Checking	312	261	184	151
Savings	2,655	1,279	835	923
Net Stock Value	1,423	746	488	581
Bonds	156	128	121	202

Married 10-18 Years

	Family Type*			
	0	1	2	3
Total Net Worth	10,281	13,118	9,189	15,464
Total Financial Worth	3,206	2,959	1,277	4,595
Total Durables	7,074	10,159	7,911	10,869
Housing Value	9,571	16,168	12,167	18,069
Mortgage	4,375	7,155	4,404	8,434
Car Value	1,054	909	603	872
Installment/Noninstallment Debt	263	891	1,266	806
Durable Goods	1,088	1,129	812	1,158
Checking	388	336	201	555
Savings	2,077	1,147	902	1,657
Net Stock Value	532	1,239	143	1,969
Bonds	209	237	32	413

Married 19-25 Years

	Family Type*			
	0	1	2**	3
Total Net Worth	19,119	20,745		22,304
Total Financial Worth	4,958	5,367		6,111
Total Durables	14,162	15,378		16,193
Housing Value	16,638	19,606		19,086
Mortgage	4,473	5,922		4,410
Car Value	1,311	1,223		1,225
Installment/Noninstallment Debt	351	742		683
Durable Goods	1,037	1,194		975
Checking	383	718		1,329
Savings	3,112	2,120		2,891
Net Stock Value	555	2,197		1,820
Bonds	907	331		69

*Family Type: 0 = No kids
1 = Kids, but none under 5
2 = Kids under 5 but no others
3 = Kids both under and over 5

**Too few observations of this family type.

A somewhat larger and more persistent association with children exists when the composition of the asset portolio is examined. Table 3.3 shows the proportion of total net worth in financial assets and housing equity by family size and by presence of young children. For young married couples the fraction of the asset portfolio in financial forms declines steadily with number of children. Although attenuated, this decline is still present for older durations. The low levels of financial assets for families with children are due principally to the negligible amounts of savings and bonds. In contrast, the proportion of net worth in the form of housing equity increases with family size, even up to 18 years of marriage. However, children appear to have reasonably permanent effects on the composition of the asset portfolio as families with children convert their financial assets into durable goods.

Regression Results

While the preceding results are suggestive, it is difficult to draw precise inferences because family size and, to a lesser extent, the spacing of children are associated closely with the normal life-cycle progression in the economic circumstance of families. In what follows, we attempt to isolate the role of children from these other phenomena by controlling for the family's income, marital duration, and an assortment of other background characteristics.

Before proceeding, we consider the relationship between the life-cycle model discussed in Section 1 and the empirical specification which forms the basis of the remaining analysis. In the life-cycle model with perfect foresight, the distinction between past and present, and between cause and effect, becomes blurred.[1] To give just one example, if families completely anticipate their future income and use savings to smooth their consumption flow, then the observed rate of savings in one year will depend not only on the entire past but also on the entire future path of income. Current savings rates and assets would be high if the family foresaw a future in which their income was low and, of course, assets would be low if the family had recently experienced a low-income period.

[1] By perfect foresight, we mean zero-error predictions of future events.

Table 3.3

DISTRIBUTION OF ASSET PORTFOLIO BY FAMILY COMPOSITION

A. By Number of Children

Duration of Marriage	0	1	2	3	4 or more
	Proportion of Net Worth in Financial Assets				
Married 1-9 years	.42	.32	.26	.19	--
Married 10-18 years	.32	.23	.25	.29	.20
Married 19-25 years	.26	.27	.28	.25	.21
	Proportion of Net Worth in Housing Equity				
Married 1-9 years	.45	.53	.61	.71	--
Married 10-18 years	.50	.65	.65	.63	.73
Married 19-25 years	.63	.64	.65	.67	.70

B. By Family Type

Duration of Marriage	No Children	Families with Children		
		Only over 5 years old	Only under 5 years old	Both over & under 5 years old
	Proportion of Net Worth in Financial Assets			
Married 1-9 years	.42	.27	.28	.25
Married 10-18 years	.32	.23	.14	.30
Married 19-25 years	.26	.26	---	.27
	Proportion of Net Worth in Housing Equity			
Married 1-9 years	.45	.60	.56	.64
Married 10-18 years	.50	.68	.85	.62
Married 19-25 years	.63	.66	---	.66

The problem posed by this is that the observed behavior of a family in one short segment of its life cycle may not be indicative of its longer-run behavior since the family, in effect, knows more about its prospects than do investigators of their behavior. In terms of empirical analysis, the issue turns on the difficulty of inferring life-cycle behavior of a "typical" family from a sample of different families observed during brief and fairly diverse stages of their lives. The hope, of course, is that families are not too fundamentally different in their behavior so that cross-family behavior is at least suggestive of how a particular family would behave if it were observed for a long period of time.

This problem is mitigated to some extent once the perfect foresight assumption is dropped. With imperfect foresight, a family should not be viewed as following a rigid, predetermined trajectory. As new information accrues, the family will revise its initial plans and will recalculate its path of desired savings, labor supply and family size. While this observation seems obvious, it has important consequences for the statistical validity of our empirical analysis. Since each family is revising its future plans on the basis of its current standing and its forecast of the future, a cross-section of different families can be treated on equal footing, since they are all, in effect, at the first step of their newly revised life-cycle plan. This should be contrasted with the situation in the perfect foresight model where different families are in different phases of predetermined life-cycle paths.[1] For the purpose of analyzing the current behavior of families, then, we should be controlling for their *current* status (age, assets, duration of marriage, number and age distribution of current children) and those measures of income which provide a forecast of their future economic circumstance. An important corollary to this view is that

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[1]For a more complete discussion of these issues in the context of fertility decisions, see Ward and Butz (1978).

successive observations on the same family can be treated as independent observations, since they refer to different, i.e., revised, life-cycle plans.[1]

The linear regression model which we use takes the form

$$A_t = \alpha_0 + \alpha_1 A_{t-1} + \sum_{i=1}^{N} B_i X_{it} \qquad t = \begin{cases} 1970 \\ 1969 \end{cases}$$

where A_t represents current assets, A_{t-1} assets lagged one year, and X_{it} a set of demographic and economic variables described below. The values of the X_{it} refer to the year during which asset accumulation took place. To illustrate, for $A_{(t=1970)}$, family size is updated for the birth occurring after 1969 asset levels were reached and the ages of children are their 1970 ages. Since our data measure assets for 494 families in three successive years, we observe the process of asset accumulation twice (between 1969 and 1970 and from 1968 to 1969). The data are pooled across these two periods allowing for a shift in the function for the 1969-1970 period.

The economic variables in these regressions are (1) previous year's net worth; (2) a four-year average of husband's income; (3) the change in husband's income between year t and t-1, entered directly and interacted with marriage duration; (4) a dummy variable indicating that family income is unstable from month to month; and (5) wife's education as a proxy for her contribution to permanent income. The demographic variables include race (1 if white), husband's age, and a linearly splined duration of marriage variable with different slopes depending on whether

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[1] This is formally correct only if "unmeasured" variables, common to a particular family, are uncorrelated over time. If life-cycle plans are revisable, then there is no *theoretical* reason for believing that successive observations on the same family are, in some sense, measuring the same thing. There remains, of course, the *statistical* argument that unmeasured variables, tastes, etc., *are* common to all periods of observation on a single family and that, as a consequence, intra-family observations are not independent.

the marriage duration was less or more than 9 years.[1] Our data give only duration of the current marriage, with no information available on whether this is the first marriage. As a partial control for previous marriages with children, we entered a variable (Divorce Proxy) which assumes the value one if the age of oldest child is greater than current marriage duration plus two years.[2] Because trade unions provide their members with many mechanisms for savings (e.g., pension plans) about which there is no information in our data, a dummy variable for union membership (for males) was included. Finally, a small fraction of the families owned businesses, but the Michigan survey did not question families about the value of such assets. As a control for business-related assets, we have included a dummy variable indicating business ownership.

There are five variables measuring family composition. To allow younger and older children to have differential impacts, the number of children more than four years old and less than five were entered separately.[3] We also allowed the effect of young children to vary with the duration of marriage. As we argued earlier, the birth of a child early in one's marriage may have different effects than one born later. In addition to the effects on family consumption, the reduction in hours worked of the wife may affect income differently depending on the life-cycle stage. In their study, Freedman and Coombs (1966) found strong

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[1]The spline marriage duration variables were constructed as follows. There are two variables for duration. If duration is less than nine years, the first variable is coded by actual duration and the second variable is coded 0. If duration is more than nine years, the first variable is coded 9 and the second variable coded actual duration -9. This allows the effect of an increase in marriage duration to differ for those married less than nine years but constrains the two linear segments to join at nine years.

[2]We have also indirectly controlled for second marriage by including a variable measuring the likelihood of this family having a marital duration of 18 years or less. See Appendix A for a complete description.

[3]Alternative specifications that separated the number of children at ages other than five were tried. The specification we used in the analysis was preferred by the data. In addition, it most closely approximates the critical pre-school, in-school distinction.

evidence that child bearing early in marriage was particularly detrimental to asset accumulation. To test this hypothesis, we included, in addition to the number of young children, a variable interacting the number of children under five with a weight (D_i) constructed from the duration of marriage. This weight D_i is defined as

$$D_i = \text{Max} \left\{0, 1 - \frac{\text{Marriage Duration}}{8}\right\}$$

With this formulation, the change in asset accumulation induced by a young child is

$$b_o + b_1 D_i$$

where b_o is the coefficient on number of young children and b_1 the coefficient on the interacted variable. Thus, the initial effect of a birth in the first year of marriage is $b_o + b_1$. This effect of a birth decays linearly (at a rate $\frac{b_1}{8}$) until the ninth year of marriage to a permanent level b_o.[1] This formulation is useful because it permits the estimation with linear regression of what is essentially a non-linear effect. The final two children variables, which represent our measure of child spacing, are the average number of years between births for two-child families and families with three or more children.[2]

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[1] For a two-year old child, the weight D_i is 1 in the second year of marriage and decays at a rate $b_1/7$ until the ninth year of marriage. Similarly, for a three-year-old and four-year-old child D_i has initial weights 1 in the 3rd and 4th year of marriage, respectively, and declines at rates $b_1/6$ and $b_1/5$ to the ninth year of marriage. After the ninth year of marriage, the presence of children 1-4 years old has an effect equal to b_o. We experimented with a number of alternative specifications of this variable. We allowed the effect to decay to different marriage durations, to vary with the age of a child from 1 to 4 years old, and to decay at different rates during the first four years of marriage and durations of 5-9 years. While not reported here, these experiments indicated that children 1-4 years old had the same effect on asset accumulation. The specification we adopted was the best in the sense that it minimized the sum of squared residuals. For the original application of this specification in a different context, see Welch, "The Effect of Cohort Size on Earnings: The Baby Boom Babies' Financial Bust."

[2] As indicated in the previous footnote, the specification of the children variables we adopted was best in the statistical sense of

In our statistical treatment of the effect of children we are implicitly maintaining that the number and age distribution of children are exogenous with respect to family savings to consumption. In a life-cycle context with planning this cannot be formally correct. Families who have a strong preference for children must, of necessity, be sacrificing other forms of consumption so that cross-sectional differences in family consumption, controllin g for income, may measure tastes for or against children. This reasoning suggests that the observed partial correlation of children with consumption (and hence savings) may be due to causation running in both directions or, more likely, their joint determination by some third, and unmeasured variable. If so, then the estimated "effect" of children on asset growth and consumption would be a biased hybrid of several linkages. A full development of this issue would require the specification of a model explaining, jointly, the fertility decisions of the family along with its consumption and savings rates. In lieu of this we have resorted to a less formal test, to determine if the endogeneity of children is somehow driving our results.

If unmeasured "tastes" for children are important for the saving and consumption decisions and if these tastes are common to a family from year to year, then errors in our consumption and asset equation in one year, for one family, ought to be correlated with the errors for the same family in subsequent years. We have computed the "within" error correlation for both asset and consumption equations. Those for the

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minimizing sum of squared residuals in the Net Worth regression. For simplicity and ease of comparison of the effects of these variables, we used an identical specification in the other five equations. There is, of course, no guarantee that this specification is necessarily the best (statistically or analytically) in these other regressions. One should keep in mind that the main purpose of these other regressions is subsidiary to the asset regression that is to decompose the effects estimates for savings. If our interest was primarily with these other regressions independent specification would undoubtedly exist for each.

asset equations (.03) are all insignificantly different from zero. The correlations for the consumption equation are .19 (significantly different from zero) for the specification reported in Table 3.5 and .02 for the model in Table B.2. The latter differ from those of Table 3.5 only in that a direct measure of the spacing between children is included. The absence of any strong "fixed effect", as measured by these correlations, is supportive of the presumed exogeneity of children for assets growth and consumption, but there is another possibility. Changes in assets or consumption on a year-to-year basis, i.e., transitory uncorrelated movements, may affect the birth decision of families and so contribute to a spurious correlation between family size and our dependent variables. Unfortunately, this argument is virtually impossible to refute given the data at our disposal. However, it seems to us difficult to argue that these transitory movements could be responsible for the measured effects of all of our variables measuring the size and age distribution of children since most of these are predetermined, i.e., are fixed before the time that our observations on period consumption and asset change are measured.

A clean resolution of the endogeneity issure is beyond the scope of this paper and our results, therefore, should be interpreted with this caveat in mind.

In addition to the asset growth regression (Table 3.4), we estimated separate equations for financial assets and durable assets (conditional on previous asset levels) in order to measure the effect of child-bearing on the composition of net worth (Table 3.4). Given the estimated effect of children on savings we are able to unravel the principal channels through which such savings adjustments occur. The most straightforward is the reduction in wives' income that results from the well-established deterrent effect of children on female labor supply. Although it has received considerably less research attention, an alternative channel is through readjustments in family consumption of market purchased goods. In addition to the obvious consumption requirements of children, this readjustment depends on the extent to which the increased level of wives' home time can replace market goods and as discussed earlier, the degree of complementarity and substitutability of other components in the market goods basket with children. Table 3.5 reports these regressions on wife's annual hours, wife's yearly income,[1] and total family consumption, respectively.[2]

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[1]For comparability with the other equations, the wives' annual hours and income equations were estimated using OLS over the full sample of women including those with zero income and hours. Although Tobit estimation is more appropriate given the zero truncation, it has been shown (see Smith (1979)) that OLS closely approximates the Tobit index function in empirical research.

[2]Because of the identity relating current income, savings, and consumption, we are able to indirectly derive the total yearly flow of consumption services for a family. The service flow of consumption in any year (C_t^f) is defined as

$$C_t^f = C_t^n + (r + \delta)\ .5\ (d_{t-1} + d_t)$$

where C_t^n represents non-durable consumption, d the stock of consumer durables at the end of period t, δ the depreciation rate of that stock, and r converts the durable stock into a yearly consumption flow. This formulation assumes that new durables are purchased uniformly during the year so that on average a family receives consumption benefits from half of newly purchased durables (i.e., $.5\ (d_{t-1} + d_t) = d_{t-1} + .5\ \Delta d_t$). Similarly, yearly consumption *expenditures* (C_t^x) are

$$C_t^x = C_t^n + \Delta d_t + .5\ \delta\ (d_{t-1} + d_t).$$

After some algebraic manipulationn, we have

$$C_t^f = C_t^x - (1-.5r)\ \Delta d_t + r d_{t-1}$$

Table 3.4

NET WORTH REGRESSIONS

("t" statistics in parentheses below coefficients)

Variable	Total Net Worth Coefficient	Total Financial Assets Coefficient	Total Durable Assets Coefficient
Net Worth Previous Year	1.0600 (90.08)	.3323 (27.57)	.7277 (48.28)
Average Male Income	.1160 (3.98)	.0722 (2.23)	.0437 (1.17)
Change in Male Income	-.0749 (-.58)	-.0197 (-.14)	-.0551 (-.33)
Change in Male Income * Marriage Duration	.0210 (1.99)	.0025 (.21)	.0185 (1.37)
Monthly Income Instability	1156 (2.98)	62.1 (.14)	1093.5 (2.20)
Wife's Education	95.6 (1.80)	197.1 (3.36)	-101.5 (-1.49)
Marriage Duration 1-9 Years	-121.5 (-1.38)	-330.1 (-3.41)	208.5 (1.86)
Marriage Duration 10-18 Years	47.12 (.80)	-89.08 (-1.37)	136.2 (1.81)
Husband's Age	-25.84 (-.76)	22.45 (.60)	-48.3 (-1.12)
Race	75.03 (.19)	-557.0 (-1.33)	652.0 (1.29)
Husband in Union	-663.7 (-2.57)	54.83 (.19)	-718.5 (-2.18)
Family Owned Business	-2262 (-2.48)	3675 (3.66)	-5937.9 (-5.09)
Number of Children Over 4 Years Old	-20.5 (-.19)	-285.8 (-2.46)	265.3 (1.96)
Number of Children Under 5 Years Old	325.0 (1.38)	675.8 (2.61)	-350.8 (-1.18)
Number of Children Under 5 * Marriage Duration	-1505.6 (-2.74)	-1930.7 (-3.19)	425.1 (.60)
λ	193.8 (.40)	704.9 (1.33)	-511.1 (-.35)
Divorce Proxy	-462.2 (-1.01)	-838.9 (-1.67)	376.7 (.64)
Year	251.5 (1.07)	146.4 (.56)	105.1 (.34)
Intercept	598.2 (.45)	-738.0 (-.50)	1336.2 (.79)
R^2	.927	.536	.782

Table 3.5

CHANNELS THROUGH WHICH CHILDREN AFFECT SAVINGS

("t" statistics in parentheses below coefficients)

Variable	Wife's Annual Hours	Wife's Income	Family Consumption
Net Worth Previous Year	-.0019 (.80)	.0101 (1.56)	.0103 (.78)
Average Male Income	-.0340 (-5.91)	-.0759 (-4.74)	.8900 (27.3)
Change in Male Income	-.0532 (-2.10)	-.1615 (-2.29)	.5079 (3.53)
Change in Male Income * Marriage Duration	.0038 (1.82)	.0128 (2.21)	-.0161 (1.37)
Monthly Income Instability	-97.6 (1.27)	-245.9 (1.15)	-15.10 (3.48)
Wife's Education	47.26 (4.51)	256.8 (8.81)	131.1 (2.21)
Marriage Duration 1-9 Years	-44.1 (2.56)	-175.6 (3.66)	-81.5 (.83)
Marriage Duration 10-18 Years	10.8 (.93)	-12.7 (.39)	-72.3 (1.10)
Husband's Age	10.17 (1.53)	23.96 (1.30)	49.4 (1.31)
Race	-141.6 (1.82)	-254.9 (1.16)	-350.3 (.80)
Husband in Union	-27.6 (.54)	-30.9 (.21)	499.2 (1.74)
Family Owned Business	-189.5 (1.06)	-640.0 (1.28)	1268. (1.25)
Number of Children Over 4 Years Old	-96.9 (4.66)	-163.4 (2.82)	-106.1 (.90)
Number of Children Under 5 Years Old	-355.4 (7.27)	-815.4 (6.35)	-1137.8 (4.36)
Number of Children Under 5 * Marriage Duration	-198.4 (1.83)	-781.3 (2.60)	723.9 (1.18)
λ	-216.9 (2.28)	-279.3 (1.06)	-471.8 (.88)
Divorce Proxy	337.8 (3.75)	1026.1 (4.10)	1316.3 (2.58)
Year	8.44 (.18)	159.3 (1.23)	668.7 (2.55)
Intercept	898.7 (3.45)	596.0 (.82)	24.8 (.02)
R^2	.184	.208	.533

Economic Variables

Although the economic variables are not of primary concern in this study, they provide a useful gauge of the soundness of our approach and the adequacy of the data. These variables passed this test remarkably well; they also suggest some intriguing adjustments in a family's consumption, savings, and labor supply decisions to new economic circumstances, especially at different stages of the life cycle. In the asset growth regression, the coefficient on previous year's net worth is approximately 1.06 implying a 6 percent return on assets. Maintaining our interpretation of average male income as a surrogate for permanent income, our estimates of the marginal propensity to save[1] and consume from permanent income are .116 and .890, respectively (see Tables 3.4 and 3.5). These estimates are well within the range of those reported by

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Total family income (Y) is

$$Y = Y_L + .5\ r\ (F_t + F_{t-1})$$

where Y_L is family labor income and F_t are financial assets.

Since $C_t^x = Y - \Delta F_t$, we can write

$$C_t^f = Y_L + .5\ r(F_t + F_{t-1}) - \Delta F_t - (1.-5r)\ \Delta d_t + rd_{t-1}.$$

Since our data provide information on all the terms on the R.H.S. of this equation, we can solve for the implied yearly flow of consumption services (C_t^f). As an estimate of r, we used the coefficient on lagged net worth in the Total Net Worth regression. See Darby (1977) for a derivation.

[1]The marginal propensity to save in the form of financial assets, however, is considerably larger than that for durable assets, while the average asset proportion (as measured by the coefficient on previous year's net worth) is skewed toward durable goods. In large part, this is probably due to the relatively young average age of our sample of families. Since durable goods have a relatively low income elasticity (i.e., are like "necessities"). The fraction of total assets composed of durable goods will be relatively high among younger and lower income families. One would expect such an ordering of average and marginal income elasticities only if our data were composed largely of families with low incomes or if imperfect capital markets caused families with low incomes early in the life cycle to behave as if their incomes were permanently low. Our results below suggest that the second interpretation is appropriate.

Mayer (1973) in his extensive survey of the consumption function literature. Wife's education, our proxy for her contribution to permanent income, also has a significant positive impact on both family savings and consumption. The dummy variable for family monthly income instability was included to capture a possible precautionary motive for savings. Families with unstable monthly incomes may insure against the risk by accumulating a larger stock of assets. Our asset equation supports this view since such families do have significantly higher levels of savings.

In the asset, consumption, female income and labor supply regressions, the response to a change in male income depends strongly on marriage duration. In the early years of marriage, an increase in husband's income across years produces a large positive increase in consumption, has negligible effects on savings, and induces a significant and partly compensatory decrease in his wife's work effort and her income. However, among couples who have been married longer, a similar rise in male income produces a smaller increment in family consumption and a significant positive increase in savings. Moreover, wives react less to their husbands' income change both in their annual working hours and income. Almost all economic theories of consumption argue that propensities to consume (save) should be lower (higher) from transitory income than from permanent income. Since we estimate smaller marginal propensities to consume and higher propensities to save out of transitory income for the average family, our evidence lends support to these theories.[1]

Our more unconventional finding involves the dependence of this effect on marriage duration. There are two factors related to length of marriage that may supply a rationale for this interaction. First, fiven past income levels, the signals inherent in yearly income changes could provide important information about differential future career wage trajectories, especially among younger workers. Uncertainty

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[1] In our consumption regression (Table 3.5) marginal propensities to consume from changes in husband's income are lower than permanent propensities at all durations. In regressions not reported here, when we included the change in husband's income variable without the duration interaction, the implied savings propensity was .18. For permanent income, the savings propensity was .11.

concerning eventual economic success and one's position in the occupational hierarchy are especially prevalent early in the career where less information has been accumulated about market worth. A young person, the beneficiary of a particularly large increase in his income, will revise upwards previous calculations of expected lifetime income. If these forces are operative, he will raise his desired permanent consumption stream and we should observe him saving less out of current income. At later stages of the life cycle when career positions have congealed, yearly income changes should provide less of this sort of signal. Income changes among more mature workers are likely to correspond more to simple interyear transitory variation, and induce larger savings responses.

A second factor involves imperfections in capital markets. Access to formal financial markets is limited at best for young couples who have not yet acquired sufficient assets to satisfy collateral and other loan requirements. In contrast to older families who can adjust to temporary departures from normal economic circumstances through savings or dissavings, younger families may be forced to absorb more of their short-term income declines in terms of current consumption. Increased availability and reliance on capital markets as marriage duration increases is consistent with our estimates of rising propensities to save (and decreasing propensities to consume) from changes in husband's income.

Capital market imperfections may also explain our estimated female labor supply and income reactions to changes in husband's income. In his justly famous article on female labor supply, Jacob Mincer (1962) argued that young wives will respond to transitory income changes of their husbands with compensating variation in their labor supply and income in order to maintain family income. The necessity for a woman increasing her work effort in response to an income loss of her husband

depends on the ability of the family to smooth income fluctuations by savings behavior.[1]

With limited access to capital markets, our evidence (Table 3.5) suggests that young families do adjust more to transitory declines in income not only by decreasing current consumption, but also by increasing the extent of labor market and income producing activities of the wife.[2]

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[1]To quote Mincer, "Adjustment between planned consumption and income received in the short period of observation...takes place via saving behavior, that is via changes in assets and debts. However, if assets are low or not liquid and access to the capital market costly and nonexistent, it might be preferable to make the adjustment to a drop in family income on the money side rather than on the money expenditure side. ...Under these circumstances, a transitory increase in labor force participation of the wife may well be an alternative to dissaving, asset decumulation, or increasing debt." See Mincer (1962), page 75.

[2]In a related study, Smith (1979) provides evidence that among young white couples, incomes of husbands and wives were strongly negatively correlated. This correlation in spouses' earnings decreased with age.

Demographic Variables

If interest rates exceed rates of time preference, consumption should increase with age and savings decrease. High interest rates future consumption less expensive and tilt life-cycle consumption profiles in favor of future consumption. While we obtain a positive sign for age in our consumption equation and a negative coefficient on savings, the statistical significance is weak. More intriguing are the results for marriage duration. We find negligible effects of duration on aggregate net worth accumulation, but length of marriage does alter the composition of the asset portfolio, especially during the early years of marriage. The longer couples are married, the more their assets are transferred from financial and liquid forms into the durable components. This coincides with popular notions that young couples initially acquire financial assets in order to purchase consumer durables such as a home--a pattern that will be important in our interpretation of children effects.

Conditional on previous net worth, race has little impact on savings.[1] Two variables (union, and business owned assets) were included in the net-worth regressions mainly to control for omitted categories of assets. The significant and large negative coefficients on both variables indicate that these individuals do substitute out of our measured assets into these unobserved components.

The variable "λ" was added to these regressions to control for the sample censoring introduced by restricting the sample to families married less than 19 years.[2] In view of its insignificant coefficient, sample censoring does not appear to be a serious problem in the net-worth regression. Including the expanded set of regressors in this regression presumably controlled for most of the potential problems created by this sample restriction.[3] Our proxy for divorce has a small negative effect

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[1] Our two composition regressions indicate that for a given level of assets, black families tend to hold less of their assets in liquid financial forms. For corroborating evidence, see Smith (1977).

[2] For a derivation of the justification of this variable, see Appendix A.

[3] The only equations in which sample censoring appears to be important are the wife's annual hours and income regressions. Presumably, unobservable factors correlated with short marriage durations are correlated with low hours and income of the wife.

on asset growth, but is associated with an increase in wife's hours and income and family consumption. This was expected since earlier research has established that a history of divorce increases female labor supply and market participation.

Children Variables

In this section, we present our empirical estimates of the impact of children on family savings. We first discuss our results obtained from Tables 3.4 and 3.5, which includes three of our children variables: the number of children over four years old, the number less than age five, and our interaction of marriage duration with young children. At the end of this section we deal with the expanded set of children variables that include our measures of spacing between births.

Table 3.6 summarizes our estimates for the effects of numbers of children under five and over five on family savings, consumption, wife's hours and income. For children under five, these are presented for young children present in the first year of marriage, which we label "the young marriage effect," and the impact of young children in the household after eight years of marriage, "the mature marriage effect." The last column in Table 3.6 gives the implied change in savings calculated from the wife's income and family consumption regressions. Note that this indirect estimate is quite close to that estimated directly in the Net Worth regression.[1]

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[1]However, not too much should be made of this. Given the indirect way we defined consumption, we expected these two estimates to be similar. Although the other regressions do not algebraically imply the consumption regression, it would be surprising if the direct and indirect estimates of savings effects were not close. In any case, the main purpose of the consumption equation is to enable us to assign the savings effects to wives' income and family consumption.

Table 3.6

SUMMARY OF ESTIMATES FOR CHILDREN VARIABLES

Number of Young Children	Net Worth	Financial Assets	Durables	Consumption	Wife's Hours	Wife's Income	Wife's Income Consumption
(a) First year of marriage	-1181	-1255	74.3	-414	-534	-1597	-1183
(b) After nine years of marriage	325	676	-351	-1138	-335	-815	323
Number of Children Over 5	-21	-286	+265	-106	-97	-163	-57

The set of children variables are significant in all regressions,[1] but their importance depends critically on the age of a child and his location in marriage duration. The number of children over four has a negligible effect on total family savings.[2] Using our hours, income, and consumption equations, we can trace this minor net impact to the following factors. First, the reduction in wives' working hours is one-fifth as large as that due to pre-school children. This smaller hours decline translates into a considerably smaller reduction in female earnings--a drop of $163 compared to $815 for young children. Finally, even this effect on savings is partly offset by a $106 reduction in family consumption. That children do not increase family consumption may seem

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[1]The following table presents F values and the associated significance level for (a) the joint significance of the three children variables, (b) the hypothesis that the "initial effect of a child in the first year of marriage is zero":

Hypothesis	Equation: Net Worth	Financial Assets	Durable Assets	Female Income	Female Hours	Consumption
a	2.54 (.0541)	5.33 (.0013)	1.78 (.1482)	34.53 (.0001)	40.84 (.0001)	7.40 (.0001)
b	6.76 (.0095)	6.26 (.0125)	.0163 (.8984)	41.11 (.0001)	35.52 (.0001)	.66 (.41)

[2]Espenshade (1975) also reports that family size did not affect savings. He also finds, with a very different specification, that young children reduce savings.

puzzling. Children certainly have a large impact on the composition of goods consumed, increasing the consumption of food and housing services and reducing that of travel, restaurant meals, and stereos. But the relative market goods intensity of a commodity we may label "child services," compared to other household commodities, is basically an empirical issue. Yet, some previous studies (see especially Espenshade, 1973) have reported positive effects of children on consumption. But these studies typically control for *current* family income rather than the long-run permanent income of the family, as measured by the husband's income and the education of the wife. The effect of this is to over-control for the mechanisms whereby families adjust to the birth of a child. Our results suggest that one of the principal mechanisms is to reduce both the hours worked by wives *and* the consumption of the family. The net effect of these is to reduce savings, at least when the child is born early in the marriage, since the reduction in wives' income is greater than the reduction in consumption.

In order to reconcile our results with these earlier studies of effect of children on family consumption, we have re-estimated the model using, instead of a four-year average of male income and the change in the male income variables, an exactly analogous set which substitutes averages and changes in family income.[1] In these regressions, children indeed have a significant positive effect on consumption. However, the interpretation of this positive effect must be made with some care. Since children reduce the hours worked and income of wives, a regression in which family income is controlled for estimates two logically distinct effects for children. First, there is the direct negative effect on family consumption measured in our regression which does not control for changes in the income of wives. Second, since wives' income falls with children, in order for family income to remain constant, male income must rise to exactly offset this decline. Hence, when viewing families with children, we are implicitly viewing those with higher levels of male income. Since there is relatively little hours-of-work change by males when children are present, most of this increase in male income is

[1]These regressions are reported in Appendix B.

due to higher wages. It is not surprising that families in which the husband has a higher wage rate consume more.[1]

Although the number of older children has a minor influence on total savings, they do alter the composition of savings. Older children significantly increase durable assets and reduce assets in financial form. This recomposition is not surprising since children increase the demand for housing and other durable goods. Since children do alter the composition of assets, comparisions across studies measuring the effect of children on savings rates must be made with great care. The estimated effects are likely to be quite sensitive to how comprehensive the asset or savings definitions are.

Young children (present early in marriage) have a much more pronounced effect on family savings.[2] For example, we find a child in the first year of marriage reduces savings by $1181. This lower savings is reflected entirely in a decline in financial assets. Since we suspect that children are complementary with durable goods, young families are forced to run down their liquid assets and increase borrowings. However, this straightforward effect belies an entire set of independent effects which can be traced through the income and consumption equations. On the income side, it is well established that young children are a strong deterrent to market work of women. We duplicate that result here, but find as well that this reduction in working hours is significantly larger earlier in marriage. It is at this point in the life cycle that female hours of work are large partly to compensate for

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[1]When we re-estimated our net-worth regressions with the family income variables substituted for our male income measures, we found almost the same negative effects of young children on savings. The reason is that controlling for family income substitutes one reason for a decline in savings (the reduction in wife's earnings) with another reason (the increase in consumption). Although we obtain a similar set of estimates of children in savings with family income variables, our interpretation of the underlying cause of this effect would be in error.

[2]Friedman and Coombs also report that concentrated child bearing early in marriage also has a large negative impact on savings.

low levels of husband's income.[1] This larger hours reduction due to the presence of a child[2] results in a larger decline in female earnings among young married couples. As a partial offset to lower female earnings, family consumption declines by $414. Family consumption declines because the increased female home time is substituted for some goods normally purchased in the market. In addition, any money costs of work associated with the wife working are also saved.

These large effects of young children decay with marriage duration until, by the ninth year of marriage, young children actually have a slight positive effect on savings. This reversal in the effect of young children is caused by a smaller decline in female earnings and working hours due to the presence of young children, and a larger reduction in total family consumption. What accounts for the differential impact on family consumption as a function of marriage? We speculate as follows. Consider the separation of total consumption into two categories--goods that are substitutes for children and those complementary with children. Durable goods (housing, etc.) are a large fraction of the second category. As we have argued earlier, the net effect of children on consumption depends on whether the reduction in substitutes offsets the increase in complements. As mentioned above, marriage duration itself is associated with a movement of assets from financial forms to durable goods. As a marriage proceeds, families will have acquired a larger stock of consumer durables, some of which were purchased in anticipation of the arrival of children. When young children do arrive, families are not required to increase their stock of these durable goods, while they do reduce those goods which are substitutes for children and wife's time. In contrast, younger families have not yet acquired those consumer durables. Hence, they must increase the purchase of these goods, which partly offsets the reduction in consumption of other goods which are substitutes for children.

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[1] Note that the effect of duration of marriage is significantly negative in the equation for wives' annual hours.

[2] In results not reported here, we found little difference in the effect of young children as a function of marriage duration in a participation equation. Thus, most of these differential hours effects for young children early in marriage reflect the *extent* of work.

To this point, we have explored the effects of children on savings conditional on husband's income allowing the principal mechanisms for savings adjustments to flow through consumption and female hours. Our presumption has been that variation in husband's earnings are determined primarily by factors other than family size. While we believe that this assumption is by and large correct, we recognize that husbands also may react in their investment and labor supply decisions to the presence and characteristics of children. In Table 3.7 we report regressions of husbands' labor supply--their annual hours--as a function of the identical children variables included in the other regressions.

Table 3.7

HUSBAND'S ANNUAL HOURS

("t" statistics in parentheses below coefficients)

Variable	Hours
Husband's Education	5.67 (.62)
Wife's Education	-11.0 (.98)
Husband's Age	3.92 (.66)
Number of Children Over Four	33.5 (2.09)
Number of Children Under Five	97.8 (2.09)
Number of Children Under Five * Marriage Duration	-131.7 (1.40)
Year	1.14 (.02)
λ	-156.5 (1.78)
Intercept	212.9 (9.46)

Family size results in an increase in husbands' work effort, but the increase in hours is larger in response to young children than older children.[1] These positive hours responses of the husband suggest that families respond to children not only by reducing wives' work, but by increasing that of husbands. Thus, our earlier regressions probably overstate the negative effect of children on savings because they control for husbands' earnings.[2]

Child Spacing

We re-estimated our empirical model including an expanded set of children variables. The two additional variables were our measures of child-spacing--the average interval in years between births for two-child families and for families with three or more children. The new coefficients for our economic and demographic variables were essentially identical to those obtained in the earlier specification. Therefore, we relegate a complete listing of all the regression results to Appendix B and report in Table 3.8 only our estimates for the children variables[3] in a form comparable to Table 3.6.

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[1] Surprisingly, we find no increase in husband's hours in "the young marriage effect." Thus, the negative savings response to young children early in marriage are not altered by consideration of husband's hours responses.

[2] Ideally, we would want measures of both husband's and wives' wage rates, so that all hours adjustment, due to children, would be freely variable. Our data, unfortunately, does not permit us this experiment.

[3] The following table presents F values and the associated significance level for (a) the joint significance of our five children variables, (b) the hypothesis that the "initial effect of a child in the first year of marriage is zero."

	Equation					
Hypothesis	Net Worth	Financial Assets	Durable Assets	Female Income	Female Hours	Consumption
a	3.14 (.0082)	3.51 (.0039)	1.64 (.1456)	21.36 (.0001)	-25.94 (.0001)	7.12 (.0001)
b	6.12 (.0135)	5.88 (.0155)	.0270 (.8694)	41.84 (.0001)	36.06 (.0001)	.99 (.32)

Table 3.8

SUMMARY OF ESTIMATES FOR CHILDREN VARIABLES

Number of Young Children	Net Worth	Financial Assets	Durables	Consumption	Wife's Hours	Wife's Income	Wife's Income Consumption
(a) First year of marriage	-1122	-1238	96	-504	-538	-1613	-1110
(b) After nine years of marriage	14	551	-538	-687	-296	-716	-29
Number of Children Over 5	-102	-353	251	26	-96	-144	-170
Spacing - 2-child families	127	-16	144	-157	-35	-54	103
Spacing - 3 or more children in family	309	122	187	-447	-40	-99	348

We decided to offer a separate set of estimates with these spacing variables included because our primary concern was to measure the effects on savings of family size per se, differentiated primarily by the age of children. We did not want the effects of these family size variables to be camouflaged by spacing considerations. A complete specification capturing all conceivable spacing patterns of child births (i.e., separated by individual parities, marriage duration, and age of wife at birth of first child) is well beyond the capability of our data to respond in an intelligent manner. Thus, we limited ourselves to these two simple measures of child spacing with the hope that they capture the essential elements of different spacing patterns of births.[1] Fortunately,

[1] It should be noted that our original specification of number of young and older children implicitly implies a crude measure of spacing. But even for families with two children--a child less than five and one older than four--large differences can exist among sub-families in the number of years between these two births. It is these differences which we are attempting to capture with our spacing variables.

the inclusion of these spacing variables did not alter the basic results obtained for the three children variables discussed earlier. Comparing Tables 3.6 and 3.8, the "young marriage effect" of young children are almost identical in the two specifications. Similarly, the results for older children and the "mature marriage effect" of young children are quite similar with one exception. In this more comprehensive model, we estimate a somewhat smaller positive effect on savings for young children born late in marriage. This result flows almost exclusively from a lower estimate of the decline in family consumption induced by a young child.[1]

Turning to our spacing variables, we estimate that longer birth intervals increase family savings. This net positive impact on savings is a consequence of a larger reduction among long spacers in family consumption than in female earnings. The lower female earnings results from a larger reduction in female labor supply among families who space their children further apart. One often-mentioned motivation for concentrated child bearing is to minimize the total amount of market work lost because of children. By concentrating her births in a relatively short span of her life cycle, a woman is able to hasten her return to the work force.[2] In support of this hypothesis, we estimate that increasing the interval between births by one year reduces female labor supply by 35-40 hours per year.[3]

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[1]We also now estimate a smaller difference in this decline in consumption as a function of when the child's birth occurred in the marriage. Also, in results not reported here, when we re-estimated our male annual hours of work equation with the spacing variables, we found no effect of spacing on male labor supply.

[2]Empirical support for this view is found in Cogan (1978), who reports that longer birth intervals are associated with larger reductions in lifetime work effort. Cogan estimates that for a woman with three children, an increase in average birth intervals from 2 to 4 years reduces market work by one year.

[3]This lower female earnings among long-spacers would normally imply lower savings among these females from the income component of savings. But although shorter birth intervals minimize the total lifetime labor market withdrawal, it may concentrate that reduction in a shorter period of the life cycle. In the period in which a short-spacer has young children, her reduction in labor supply and earnings per period may be larger than that of a long-spacer. The larger total lifetime withdrawal of

The increase in savings for long-spacers results primarily from reduction in family consumption. Factors that operate to concentrate consumption in relatively short time spans will have a depressing impact on savings. Concentrated child bearing is analogous to bunching the influence of children in a short period and may produce a bunching of consumption as well. In contrast, long-spacers have "smoothed" the effects of children over the life cycle inducing a smoothing of consumption.[1]

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long-spacers then flows from the greater number of periods with young child present which offsets the smaller more uniform reduction per period.

[1] In addition, children spaced further apart may permit a family to take advantage of more economies of scale in consumption through the "hand-me-down" effect.

CONCLUSIONS

In this paper, we provide estimates of the effects of children on asset accumulation, asset composition, consumption, and family income. We estimate that the net effect of young children is to depress savings for young families, but to increase savings for marriages of duration greater than five years. We find that conventional wisdom, which associates large family size with higher consumption levels, is incorrect. The principal channel through which children act to reduce savings in the decline in female earnings associated with the child-induced withdrawal of wives from the labor market. Family consumption actually decreases with the birth of a child but this reduction is insufficient to offset the fall in family income.

We also find that the impact of children on the family's financial position is critically dependent on the duration of marriage. Children born early in a marriage reduce assets by approximately twelve percent while those born after nine years of marriage increase assets by two percent. This difference is due to two effects: early child bearing has a somewhat smaller negative effect on consumption and also induces a larger negative effect on female earnings. Our results on asset composition indicate that early births are associated with a switch from financial to durable goods assets, while for the later births this effect is greatly reduced. Families who have children early in marriage hasten this recomposition, while for delayed births, the shift has already occurred. As the child ages and enters school, his effect on family savings is greatly reduced. On average, wives with school-age children have $163 lower earnings, but their families consume $106 less. The net effect on savings is insignificant.

These results contrast sharply with earlier research which has found significant positive effects of children on family consumption. We duplicate these results and show that they are due to a misspecification of the family income constraint in which current family income rather than the permanent level is held constant. By allowing in our specification for families to freely allocate their time between the market and home, we

have found that children induce a substitution toward "leisure" and away from market goods. For families in which the wife is not working, our consumption effect suggests that, on net, savings may actually increase with children.

For the more traditional economic determinants of savings and consumption, our results are consistent with earlier findings. The marginal propensity to consume out of permanent male income is approximately .89, while out of transitory income it is between .50 and .30. We do offer new evidence that a family's response to changes in husband's income varies systematically with marriage duration. Among young married couples, more of the response to a decline in husband's income is absorbed by family consumption. In addition, the wife compensates in part for this income decline by increasing her market work and income. In contrast, among couples married for longer periods, short-run changes in husband's income are reflected primarily in family savings.

Appendix A

RESTRICTING THE SAMPLE BY MARRIAGE DURATION

The data file we used in this study contained information only on children less than 18 years old, and we therefore confined our statistical analysis to families who were married less than 19 years in 1970. This raises an issue of whether the research results we report in the text are biased as a consequence of our deliberate censoring of our sample. In this appendix, we discuss the nature of the potential bias and our statistical remedies to control for it.

That this sample censoring should be a source of concern is illustrated in Table A.1. The cross-sectional net-worth age profiles in this table are pooled over the three years of the panel. The column labelled "change in net worth" measures the difference in holdings between 1968 and 1970 for each 1968 age group. These profiles are provided separately for families married less than 19 years in 1970, those married more than 18 years, and for the combined sample. The sample sizes demonstrate that the vast majority of families under 35 are in our restricted sample and those over 50 are excluded. For families whose husband was between 35 and 50 years old in 1970, the proportion of families in our restricted sample declines rapidly with the husband's age.

If we compare the full sample to those married less than 19 years, both the cross-sectional and longitudinal net worth patterns differ considerably in the critical 35-50 year age intervals. In this age range, our restricted sample systematically selects families with lower net worth and smaller changes in net worth over time. The differences between these samples are less severe for the change in net worth which conditions on previous levels, but it is clearly present. It should be noted that this table may exaggerate the potential severity of the problem if the differences between the excluded and included families are adequately captured by other control variables in our regression. However, if there exist unobservable characteristics among families that determine both asset growth and marriage duration, our results will be biased unless we introduce explicit controls for sample censoring.

Table A.1

LIFE CYCLE NET WORTH PROFILES

Age Group	Full Sample			Married Less Than 19 Years			Married More Than 18 Years		
	Net Worth	Change in Net Worth	Sample Size	Net Worth	Change in Net Worth	Sample Size	Net Worth	Change in Net Worth	Sample Size
>25	2,853	2,019	65	2,853	2,019	65	---	---	0
26-30	6,976	3,282	128	6,976	3,282	128	---	---	0
31-35	10,570	3,418	124	10,643	3,620	121	-14,213	-4,720	1
36-40	13,356	4,642	144	11,459	4,285	93	18,409	5,292	26
41-45	13,105	6,165	138	10,369	3,425	39	23,610	7,282	75
46-50	16,036	4,284	151	10,951	4,128	24	19,447	4,313	127
51-55	19,437	3,534	115	13,826	2,539	15	25,282	3,683	104
56-60	25,817	4,788	98	7,590	2,877	8	27,160	4,957	103
60+	3,922	-2,202	3	---	---	0	30,928	-2,202	37

The statistical techniques we employed for this purpose were adopted from recent innovations in the econometrics of female labor supply devised to control for sample censoring resulting from missing wage data for non-working women.[1] To transfer that methodology to our problem, let Y_1 index whether a woman has been married less than 19 years with $Y_1 = 1$ if marriage duration is less than 19 years and equal to 0 otherwise. We take this index to be a function of certain measurable variables, represented by the vector X, and other unobservable characteristics of the family, captured by the error U_1, so that we can write

$$Y_1 = \alpha X + U_1 \quad \text{where } Y_1 = \begin{cases} 1 & \alpha X > -U_1 \\ \text{if} & \\ 0 & \alpha X < -U_1 \end{cases} \qquad \text{(A.1)}$$

[1] For an exposition of these statistical problems and an application to female labor supply see Heckman (1979). We follow Heckman's treatment in the text.

The behavioral relationship to be estimated for all families is of the form

$$Y_2 = BZ + U_2 , \qquad (A.2)$$

where Z and X may have some variables in common and U_2 is independent of Z. However, because of data limitations, A.2 can be estimated only for families with $Y_1 = 1$. Within this subsample, Y_2 has expected value

$$E(Y_2|Y_1=1) = BZ + E(U_2|U_1>-\alpha X) \qquad (A.3)$$

Unbiased estimates of B are retrieved only if the conditional mean of U_2 is zero and is uncorrelated with Z. In his work, Heckman suggests the following solution to this problem. Using well-known properties of truncated normal distributions,

$$E(U_2|U_1>-\alpha X) = \frac{\sigma_{12}}{(\sigma_{11})^{\frac{1}{2}}} \lambda,$$

where σ_{12} is the covariance between U_1 and U_2, σ_{11} is the variance of U_1 and λ is the inverse of Mill's ratio--the ratio of an ordinate of a standard normal distribution to its tail area.[1]

A.3 can then be rewritten as

$$E(Y_2|Y_1=1) = BZ + \frac{\sigma_{12}}{(\sigma_{11})^{\frac{1}{2}}} \lambda. \qquad (A.4)$$

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[1] $\lambda = \frac{\phi(R_i)}{1-\Phi(R_i)}$ where ϕ and Φ are the density and distribution function for a standard normal variable and $R_i = \frac{-\alpha X}{(\sigma_{11})^{\frac{1}{2}}}$ is estimated from the probability of marriage duration less than 19 years.

Thus, the bias in estimating A.3 can be thought of as resulting from a missing variable, λ. Since we have data on the excluded families, we estimated a probit function for the probability of sample inclusion (i.e., married less than 19 years) providing an estimate of λ for all families. In addition to its obvious dependence on age, this probability depends on family characteristics related to age at marriage and the possibility of previous marriages. Our regressors included a splined husband's age variable,[1] race, husband's education, the number of young and older children in the family, the age of the oldest child,[2] and the difference in spouses' ages and education. The difference in spouses' ages and education were included because they are known to be correlated with divorce probabilities. For example, the larger the difference between husbands' and wives' ages, the more likely that we are observing a second marriage and the more probable, for any given husband's age, that the family is in our sample.

The probit estimates are listed in Table A.2. As expected, husband's age significantly reduces the probability of a short marriage duration while the presence of young children increases length of marriage. A larger difference in spouses' ages and being black both increase the likelihood of sample inclusion, reflecting the higher incidence of divorce for these groups. This probit function predicted the probability of sample inclusion quite well. The mean values of λ were .32 for those actually married less than 19 years and 1.58 for those married more than 18 years.[3]

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[1]The husband's age variables were splined into linear segments of ages 20-35, 36-40, 41-45, 46-50, 51-55, 56-60, 61+. For example, if a husband was 30 years old, he would be coded 10 in the first segment and receives zero in all the others. If a husband were 38 years old, he would be coded 15 in the first segment, 3 in the second and zero in the remaining segments. So, for a husband in any age segment, he receives the maximum value for all the previous segments, zeros for all the succeeding segments, and his age minus the maximum age of the preceding segment for this own segment.

[2]It should be noted that one should not assign a behavioral interpretation to these family size variables in this probit equation. As mentioned in the text, we know that complete family size is underreported for larger marriage durations due to the absence of data on children over 18. The purpose of this probit equation is solely to predict the probability of sample inclusion. The underreporting of family size among older families is simply part of the information contributing to this predicted probability.

[3]λ is a negative function of the probability of marriage less than 19 years. Thus, low values of λ reflect high probabilities of sample inclusion.

Table A.2

PROBIT ESTIMATES OF PROBABILITY OF DURATION OF MARRIAGE LESS THAN 19 YEARS IN 1970*

Variables	Coefficient	Asymptotic "t" Statistics
A. Splined Husband's Age Variables		
Ages 20-36	-.2423	-0.85
Ages 36-40	-.4072	-4.85
Ages 41-45	-.1927	-3.73
Ages 46-50	-.0935	-1.83
Ages 51-55	-.1274	-2.12
Ages 56-60	.0010	0.01
Ages 61+	-.1565	-0.65
Husband's Education	-.0307	1.33
Race	-.3745	-1.83
Number of Children less than 6	.2624	1.77
Number of Children older than 6	.0208	0.38
Age of Oldest Child	-.0541	-4.04
Difference in Spouses' Ages	.0858	5.84
Differences in Spouses' Education	-.0013	-0.05
Constant	6.789	1.44

(-2.0) times log likelihood ratio = 771.99

Degrees of Freedom for Chi-Square = 14

*Dependent Variable equals 1 if married less than 19 years in 1970.

To correct for sampling censoring, we included the estimated value of λ for each family in the regressions reported in the text. A simple check on the reasonableness of this correction is provided in Table A.3.

Table A.3

ESTIMATED NET-WORTH AGE RELATIONSHIP

(standard errors in parentheses)

Independent Variables	Full Sample	Restricted Sample	
Constant	-7345	507	-4516
	(2882)	(2897)	(4909)
Age	584	328	493.8
	(64.7)	(78.9)	(153)
λ			-2928
			(2311)

This table is an attempt to duplicate with regressions the basic characteristics of Table A.1. Similar to the patterns observed in Table A.1, the regressions indicate a smaller change in assets with age and a larger intercept in the restricted sample. However, when the correction for sample censoring is included, the estimates for the restricted sample more closely resemble those of the full sample. The age coefficient is now 84 percent as large as that in the full sample; without adjustment for censoring it was 56 percent as large. In addition, the intercept for the restricted sample becomes large and negative as it was in the full sample. The negative coefficient on λ indicates that the residual correlation in the probability of a shorter marriage and asset level are negatively correlated, which seems eminently reasonable. While these regressions do not prove that all problems of sample censoring are eliminated by this technique, they do increase our confidence that some of the most perverse effects are controlled.

Appendix B

SUPPLEMENTARY REGRESSIONS

In this appendix we present some supplementary regressions that were alluded to in the text. Tables B.1 and B.2 give our basic set of equations including the two child-spacing variables--average spacing between births (in years) for families with two children, and three or more children, respectively. Table B.3 lists the Net Worth and Family Consumption regressions in which average family income and the change in family income are substituted for the variables average husband's income and the change in husband's income.

Table B.1

NET WORTH REGRESSIONS WITH
CHILD-SPACING VARIABLES

("t" statistics in parentheses below coefficients)

Variable	Total Net Worth Coefficient	Total Financial Assets Coefficient	Total Durable Assets Coefficient
Net Worth Previous Year	1.0593 (90.28)	.3323 (25.55)	.7271 (48.26)
Average Male Income	.1092 (3.74)	.0686 (2.12)	.0406 (1.08)
Change in Male Income	-0.711 (-.56)	-.0155 (-.11)	-.0556 (-.34)
Change in Male Income * Marriage Duration	.0208 (1.97)	.0021 (.18)	.0187 (1.38)
Monthly Income Instability	1236 (3.17)	66.26 (.15)	1169.8 (2.34)
Wife's Education	91.0 (1.71)	198.2 (3.37)	-107.2 (-1.57)
Marriage Duration 1-9 Years	144.4 (-1.63)	-323.4 (-3.29)	178.9 (1.57)
Marriage Duration 10-18 Years	2.88 (.05)	-94.48 (-1.39)	97.4 (1.23)
Husband's Age	-15.32 (-.45)	24.92 (.67)	-40.2 (-.93)
Race	171.5 (.44)	-557.8 (-1.28)	729.3 (1.44)
Husband in Union	-772.0 (-2.97)	28.86 (.10)	-801.0 (-2.40)
Family Owned Business	-2244 (-2.47)	368.8 (3.67)	-5931 (5.09)
Number of Children Over 4 Years Old	-102.0 (-.88)	-352.7 (-2.75)	250.6 (1.68)
Number of Children Under 5 Years Old	13.6 (.05)	551.3 (1.92)	-537.7 (-1.62)
Number of Children Under 5 * Marriage Duration	-1136 (-2.02)	-1769.6 (2.84)	633.5 (.88)
Average Spacing 2-Child Family	127.4 (1.78)	-16.00 (.20)	143.4 (1.56)
Average Spacing 3-Child Family	308.5 (2.79)	122.0 (.99)	186.5 (1.31)
	198.7 (.41)	667.1 (1.25)	-468.4 (-.75)
Divorce Proxy	-942.9 (-1.92)	-916.8 (-1.68)	-26.1 (-.04)
Year	244.4 (1.04)	137.5 (.53)	106.6 (.35)
Intercept	392.6 (.30)	-799.1 (-.54)	1197.7 (.71)
R^2	.927	.536	.782

Table B.2

CHANNELS THROUGH WHICH CHILDREN AFFECT SAVINGS
WITH CHILD-SPACING VARIABLES INCLUDED
("t" statistics in parentheses below coefficients)

Variable	Wife's Annual Hours	Wife's Income	Family Consumption
Net Worth Previous Year	-.0017 (.73)	.0103 (1.60)	.0101 (.77)
Average Male Income	-.0334 (5.79)	-.0739 (4.60)	.9002 (27.7)
Change in Male Income	-.0529 (2.09)	-.1622 (2.30)	.5014 (3.51)
Change in Male Income *Marriage Duration	.0037 (1.79)	.0128 (2.21)	-.0157 (1.34)
Monthly Income Instability	-115.6 (1.51)	-277.0 (1.30)	-1616. (3.73)
Wife's Education	48.65 (4.64)	258.8 (8.87)	136.5 (2.30)
Marriage Duration 1-9 Years	-36.8 (2.10)	-165.2 (3.39)	-54.9 (.56)
Marriage Duration 10-18 Years	19.8 (1.64)	-3.85 (.11)	-13.3 (.19)
Husband's Age	8.34 (1.25)	20.3 (1.09)	34.9 (.93)
Race	-159.2 (2.05)	-289.0 (1.34)	-482.1 (1.10)
Husband in Union	-9.02 (.17)	7.16 (.05)	649.6 (2.25)
Family Owned Business	-190.5 (1.06)	-645.3 (1.29)	1237.8 (1.22)
Number of Children Over 4 Years Old	-96.13 (4.21)	-143.8 (2.26)	26.4 (.20)
Number of Children Under 5 Years Old	-295.9 (5.79)	-715.7 (5.03)	-686.5 (2.38)
Number of Children Under 5 * Marriage Duration	241.6 (2.17)	-897.1 (2.90)	183.1 (.29)
Average Spacing 2-Child Family	-34.8 (2.47)	-53.5 (1.36)	-156.9 (1.97)
Average Spacing 3-Child Family	-39.5 (1.81)	-99.1 (1.63)	-446.7 (3.62)
λ	-228.6 (2.41)	-288.5 (1.09)	-462.6 (.86)
Divorce Proxy	19.8 (1.63)	1201.8 (4.43)	1966.1 (3.59)
Year	7.73 (.17)	160.6 (1.24)	681.0 (2.61)
Intercept	930.7 (3.58)	665.8 (.92)	313.9 (.21)
R^2	.188	.209	.538

Table B.3

EQUATIONS REESTIMATED WITH FAMILY INCOME VARIABLES

Variable	Family Consumption	Net Worth
Net Worth Previous Year	.0012 (.10)	1.0566 (90.49)
Average Family Income	.9583 (33.06)	.1240 (4.34)
Change in Family Income	.6666 (5.68)	-.0833 (.72)
Change in Family Income * Marriage Duration	-.0278 (2.86)	.0208 (2.16)
Monthly Income Instability	-1388. (3.53)	1239. (3.20)
Wife's Education	-96.3 (1.75)	61.81 (1.14)
Marriage Duration 1-9 Years	125.7 (1.40)	-132.1 (1.50)
Marriage Duration 10-18 Years	-13.91 (.22)	-.81 (.01)
Husband's Age	11.4 (.33)	-19.4 (.58)
Race	-209.5 (.53)	205.4 (.53)
Husband in Union	605.8 (2.31)	-774.8 (2.99)
Family Owned Business	1789. (1.95)	-2167.7 (2.39)
Number of Children Over 4 Years Old	176.5 (1.50)	-85.7 (.74)
Number of Children Under 5 Years Old	-128.4 (.48)	103.2 (.40)
Number of Children Under 5 * Marriage Duration	1027.8 (1.81)	-1076.9 (1.92)
Average Spacing 2-Child Family	-105.1 (1.45)	131.3 (1.84)
Average Spacing 3-Child Family	-346.2 (3.10)	321.4 (2.92)
λ	-165.3 (.34)	258.1 (.54)
Divoice Proxy	901.3 (1.80)	-1104. (2.23)
Year	662.6 (2.78)	254.4 (1.09)
Intercept	-387.5 (.29)	366.2 (.27)
R^2	.618	.927

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